PB-229 843

PROCEEDINGS OF MEETING ON PROBLEMS WITH STEEL DRUMS AS FLOATATION DEVICES IN LAKES AND RESERVOIRS, HELD AT THE ATLANTA AIRPORT INN, ON JULY 23, 1963

Federal Water Pollution Control Administration
Atlanta, Georgia

July 1969

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PROCEEDINGS OF MEETING ON PROBLEMS WITH

STEEL DRUMS

AS

FLOATATION DEVICES

IN

LAKES AND RESERVOIRS

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Southeast Region Atlanta, Georgia

JULY 1969

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UNITED STATES GOVERNMENT

Memorandum

U. S. DEPARTMENT OF THE INTERIOR
Federal Water Pollution Control Administration

TO : Regional Director
Middle Atlantic Region

DATE: November 18, 1969

FROM : Water Quality Standards Coordinator
Southeast Region

SUBJECT: Summary of Meeting on Problems of Steel Drums as Floatation Devices in Lakes and Reservoirs

Two subsequent fish kills occurred on Boone Reservoir, Tennessee, which were ultimately traced to a toxic compound of mercury entering the reservoir inadvertently from steel drums used as floatation devices. Because of the interest in this problem, the Southeast Region sponsored a meeting with all interested agencies to discuss this problem and outline any potential methods for control.

A summary of the meeting and discussions is included in the attached report which Mr. Thoman asked me to forward you for your information. A limited number of additional copies are available upon request.

Howard D. Zeller

Attachment

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PROCEEDINGS OF MEETING

on

PROBLEMS WITH STEEL DRUMS

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Southeast Region
Federal Water Pollution Control Administration
U. S. Department of the Interior

July 1969

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MEETING AGENDA

FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
PROBLEMS WITH STEEL DRUMS USED AS FLOATATION DEVICES

July 23, 1969
Atlanta Airport Holiday Inn

10:00-10:30 a.m.	Opening Remarks	John R. Thoman Regional Director FWPCA
10:30-11:15 a.m.	Floatation Units for Floating Facilities in Reservoirs	C. E. Solomon Construction-Operations Corps of Engineers, SAD
11:15-11:35 a.m.	Water Quality Aspects	W. R. Nicholas Assistant Chief Water Quality Branch TVA
11:35-12:00 noon	TVA Program on Removal of Steel Drums	J. Porter Taylor Director, Division of Reservoir Properties TVA
12:00-1:30 p.m.	LUNCH	
1:30-4:00 p.m.	Floor Discussions by Meeting Participants	Discussion Leaders: FWPCA TVA Corps of Engineers

OPENING REMARKS

by
John R. Thoman

I would like to take this opportunity to welcome all of you to this meeting today and to thank you for the interest you have expressed in this unique problem of water pollution. Your presence confirms the great emphasis being placed on our recreational uses of water throughout the country and particularly in the southeastern United States. The Southeast has perhaps the most abundant supply of water resources and is the most heavily used water-oriented recreational area in the nation.

The recent fish kills in Tennessee's Boone Reservoir could very well be classified as an isolated incident. On the other hand, the fish kills were caused by indiscriminate use of steel drums as floatation devices, and it's possible that similar incidents could occur on any reservoir at any time. This, of course, is the basis for our meeting here today.

As we pointed out in our correspondence to you regarding discussions on this problem, this meeting is to be yours, not ours. We have asked the Corps of Engineers and TVA to assume the leadership in their presentations regarding present control programs. The Federal Water Pollution Control Administration will serve as a clearing house and is available for coordination and technical assistance through the Southeast Water Laboratory in Athens.

As we move into the formal meeting, we have asked the Corps of Engineers and the Tennessee Valley Authority to discuss their experiences with problems stemming from the use of steel drums as floatation devices. We also have asked them to provide us with results of their past control programs and to give us information on present regulations. During the afternoon, the meeting will take the form of a workshop to discuss operational problems and to address any questions to the Corps of Engineers and TVA. I am also soliciting your thoughts on what we in the Federal Water Pollution Control Administration can do to help.

Because of the emphasis placed on the Boone Reservoir incident, I should like at this time to give a brief summary of the fish kill and provide you with the benefit of some of the techniques we utilized in our investigation.

The massive fish kill began on May 9, 1969, on the South Fork Holston arm of Boone Reservoir and continued through May 13. Over 2.3 million fish died, nearly all of which were shad. A multi-disciplinary team from several federal and state agencies was on-site during the kill.

Causes quickly ruled out were pH, dissolved oxygen and temperature. Ammonia, chemical oxygen demand, total organic carbon, pesticides, heavy metals, and cyanides were also eliminated as possible contributing factors, though mercury was known to be toxic at levels lower than the sensitivity of available analytical procedures.

TVA ruled out algal toxicants as the cause of the kill since plankton populations were normal in diversity and numbers. On May 20, FWPCA reported that there was no evidence of acetylcholinesterase

inhibition, which ruled out pesticides of the organo-phosphorous and carbamate types. Auburn University reported on May 22 that fish collected at the time of the kill had no parasites and no disease and that two strains of bacteria cultured were normal.

FWPCA repeated TVA's May 21 chemical analysis for metals and pesticides, and confirmed the TVA results. Residues from a carbon filter extract were given to FWPCA after a TVA analysis for pesticides was negative. A conference of the two agencies on May 23 examined all findings to date and decided that samples of fish in the hands of FWPCA should not be used until more reliable clues were available.

During the week of May 26, FWPCA ran infrared and mass spectrometer analyses on the TVA carbon filter extracts, and sent a water sample to the Atomic Energy Commission's Savannah River Plant for spark source mass spectroscopy. On May 27, FWPCA provided a group of kill fish to the University of Georgia for histological examination of kidneys and decided to perform chemical analyses on other fish kidneys.

On May 30, the Atomic Energy Commission reported 9 parts per billion of mercury in the water sample, and the University of Georgia reported tubular destruction in the fish kidneys, a condition symptomatic of mercurial poisoning. FWPCA's kidney analysis by chemical methods produced no results.

Based on the fact that mercury was present at levels above that known to cause death when in a form that could be in the reservoir, and on the destruction of kidney tubes, the FWPCA on May 30 stated that "presumption is high that the cause of the fish kill was mercury in some form."

During the week of June 1, FWPCA performed analyses on sediment samples collected May 28 but was unable to implicate adsorption-desorption phenomena from this source as the mode of entry of mercury to the water.

In conclusion, the following was proposed:

1. Mercury, in some form, was the most probable cause of the fish kill in Boone Reservoir beginning May 9, 1969. Mercury was present in the water at a level of 9 parts per billion.
2. Mercury in a specific organic compound is toxic at a level of less than one part per billion. The probability is high of this compound being present.
3. The entry of this compound was most likely from an empty drum or drums used as a floatation device which became floated as the reservoir was raised about five feet during the kill period.

This concludes my remarks. A complete summary of the fish kill investigation is available from the Regional Office in the event you are interested in more detail.

FLOATATION UNITS FOR FLOATING FACILITIES ON CORPS RESERVOIRS

by
C. E. Solomon
Construction-Operations Division
Corps of Engineers, South Atlantic Division

1. I will first present a brief resumé of certain Corps program authorities as background material for my later remarks dealing more specifically with the subject of my topic.

2. The Civil Works program of the Corps of Engineers had its beginning in 1824 with passage of the first River and Harbor Act by the Congress. This initial mission was directed primarily at the improvement and maintenance of the nation's waterways and harbors. The Civil Works program has been expanded over the years by the Congress to include other water resource improvements. It was not until the late 1930's that the Congress included reservoirs for flood control, hydro-electric power, and other purposes to any significant extent in the Corps' Civil Works program. However, most of our operating reservoirs have been constructed since the end of World War II (1945). The authority for the Corps to develop the recreation resources of its reservoir projects was issued by the Congress in the middle 1940's.

3. The Corps of Engineers develops and manages the recreation resources of its reservoir projects under the authority contained in the Flood Control Act of 1944 (Public Law 78-534 approved 22 December 1944). This initial basic legislative authority was amended by the Flood Control Act of 1962 (Public Law 87-874 approved 23 October 1962) to make it applicable to all water resource development projects of the Corps of Engineers. Rules and regulations governing public use of

Corps reservoir areas, prescribed by the Secretary of the Army, are published in Title 36, Chapter III, Code of Federal Regulations. The rules and regulations concerning navigation and navigable waters of the United States prescribed by the Secretary of the Army and published in Title 33, Chapter II, Code of Federal Regulations, are also applicable to navigable reservoirs of the Corps.

4. It is the policy of the Corps of Engineers to require boathouses, boatdocks, and other recreation related facilities on its reservoirs to be floating structures. This general policy was adopted because of the water level fluctuation characteristics of most Corps reservoirs, which makes fixed structures of this nature rather impractical. Therefore, most of the floating recreational facilities over which the Corps would have some control at its different types of projects are located on its reservoirs.

5. The Corps' rules and regulations governing public use of reservoirs (Title 36 mentioned earlier) require a permit from the Corps of Engineers for placing structures in or on the reservoir. Location and construction plans are required for review and approval before the necessary Corps permit for the structure is issued.

6. The use of metal drums as floatation units for floating recreational facilities was a common and acceptable practice at the time the Corps reservoir construction program really got underway near the close of World War II. Metal drums, usually oil barrels, were readily available and relatively economical. Plastic buoyant material for life rafts, floating heavy equipment, and other purposes was developed during World War II. Industry pursued development of

plastic buoyant materials after World War II for the commercial market. These early products were forerunners of the various plastic buoyancy materials used today as floatation units for floating facilities. As these early products were tested and improved and became more and more accepted by the public, the Corps encouraged applicants for floating facility permits at its reservoir projects to consider the use of plastic buoyant material for the floatation units in lieu of the conventional metal drums. This effort produced some degree of success as will be shown by some statistics to be given later in my remarks.

7. The Corps of Engineers has gone through three time-phases with relation to floatation units for floating recreational facilities at its reservoir projects. They are as follows:

a. 1944 to 1967. - Metal drums were acceptable for both non-commercial and commercial floating recreational facilities. In the latter part of this period Corps encouraged consideration of plastic buoyant material for floatation units in lieu of conventional metal drums.

b. 1967. - Corps issued regulation requiring "floatation by styrofoam, or equal, no iron barrels" for floating recreational facilities provided by commercial concessions and public agencies.

c. 1969 (24 Feb.). - Corps issued regulation requiring that "boat mooring buoys and floatation units of floating facilities shall be constructed of material which will not become waterlogged or sink when punctured." This permits use of metal drums filled with a suitable buoyant material. This

regulation is applicable to non-commercial floating recreational facilities. Floatation units of all new facilities must meet this requirement to be eligible for the required Corps permit. Owners of existing facilities with floatation units not conforming to this new requirement are being given from three to five years to meet this new requirement. We wanted to allow a reasonable period of time for replacement of metal drums with acceptable floatation units. Ordinarily, metal drums without a protective coating do not last over five years. This allowable time period will permit the owners of such facilities to obtain full use of existing metal drums with conversion occurring at normal replacement time.

8. I have obtained some data from the Reservoir Managers at nine reservoirs in the South Atlantic Division in an effort to get some indication of our current situation with respect to the use of metal drums for floatation units (see attached tabulation). A summary of these data is as follows:

Combined water surface area of 9 reservoirs (acres)	318,200
Non-commercial floating facilities	
Total number of structures	5,824
Percent with metal drums	32
Commercial floating facilities	
Total number of boat spaces	3,588
Percent with metal drums	10

Two of these reservoirs have no commercial or non-commercial floating facilities with metal drums and three others have no commercial

floating facilities with metal drums. The Reservoir Managers at these nine reservoirs were also asked if they had knowledge of any known cases where water pollution, fish kills, odor, etc., had been conclusively traced to residue material from metal drums used as floatation units at their reservoirs, and each gave a negative answer.

9. Let us briefly review some of the advantages and disadvantages of metal drums and plastic buoyant materials.

a. Metal drums.

(1) Low initial cost.

(2) Filling with acceptable plastic buoyant material substantially increases cost.

(3) Applying protective coating to prolong useful life is limited to materials which would not have an adverse effect on the water and this measure further increases the cost.

(4) Relative short life requires frequent replacement (unprotected drums 3 to 5 years).

(5) Floating metal drums or sunken metal drums in shallow water are serious hazards to boats, skiers, and swimmers.

(6) Metal drums used for storing certain toxic chemicals or other materials are a potential pollution hazard unless thoroughly emptied and cleaned before using as floatation units.

b. Plastic buoyant material.

(1) Higher initial cost than metal drums.

(2) Longer useful life reduces overall cost.

(3) Under certain conditions, solvents (such as gasoline and oils) and water animals (beaver, muskrat, and otter) are detrimental to the regular plastic buoyancy material. However, material has been developed which is highly resistant to solvents. Nest building by water animals in the material is discouraged by design and/or use of galvanized wire mesh covering. Sea gulls are discouraged from pecking out pieces of the material by painting it orange. These preventive measures, when required, do increase the initial cost.

(4) Less likely to get loose from facility and, if it does, it is not nearly the hazard to boats, skiers, and swimmers as metal drums.

10. Colonel R. P. Tabb, Acting Division Engineer, is interested in eliminating the use of conventional type metal drums as floatation units for floating facilities at South Atlantic Division reservoirs. We believe that the Corps' current regulations governing permits for floating facilities is headed in that direction. We also believe that owners of existing floating facilities are entitled to a reasonable time to comply with our recently revised regulations as they pertain to floatation units. Our current regulations on floatation units could very well eliminate the use of even metal drums filled with an acceptable buoyant material within the next 4 to 6 years. Any further revision of current Corps regulations to completely prohibit the use

of metal drums (even those filled with a buoyant material) as floatation units for floating facilities would require approval of the Chief of Engineers.

11. It is generally difficult for the public to understand and accept the need for any change in regulations that prohibits something which has regularly been approved for many years. Any program to completely prohibit the use of metal drums (even those filled with a buoyant material) as floatation units for floating facilities should consider the following:

a. Sound justification to obtain necessary approval of each reservoir managing agency (public and private) to completely prohibit metal drums.

b. Support by all agencies concerned.

c. Information program to apprise public of the pros and cons on metal drums vs. plastic buoyant material as floatation units.

Resumé of presentation at meeting called by Federal Water Pollution Control Administration (Atlanta Office) at Airport Holiday Inn, Atlanta, Georgia, 10:00 A.M., 23 July 1969.

Floatation Unit Data
South Atlantic Division, Corps of Engineers
15 July 1969

Item	Scott	Allatoona	George	Lanier	Seminole	Clark Hill	Hartwell	Kerr	Philpott	Total
Water surface area (acres)	1,500	11,900	45,700	38,000	37,500	71,500	56,000	53,200	2,900	318,200
Non-commercial floating facilities										
Total number of structures	13	600	70	2,500	55	564	1,692	300	30	5,824
Percent with metal drums	0	75	10	30	0	50	6	75	90	32
Commercial floating facilities										
Total number of boat spaces	50	550	116	2,200	0	198	362	100	12	3,588
Percent with metal drums	0	30	0	0	0	8	0	5	100	10
Any known cases where water pollution, fish kills, odor, etc., has been conclusively traced to residue material from metal drums?	No	No	No	No	No	No	No	No	No	--

WATER QUALITY ASPECTS

by
William R. Nicholas
Assistant Chief, Water Quality Branch
Division of Environmental Research and Development
Tennessee Valley Authority

My remarks this morning, relative to steel drums as floatation devices, will be restricted to the Tennessee Valley Authority impoundments and for the most part I will limit my comments to water quality conditions encountered in Boone Reservoir.

Boone Reservoir is located in northeast Tennessee in Sullivan and Washington Counties between the cities of Bristol, Elizabethton, Kingsport, and Johnson City. It is formed by Boone Dam, located on the South Fork Holston River at river mile 18.6, 1.4 miles below its confluence with the Watauga River. Thus, Boone Reservoir has two major arms. At normal maximum pool level, elevation 1385, backwater extends 17.3 miles on the South Fork Holston River and 15.3 miles on the Watauga River.

A number of fish kills have been reported in the past from the Watauga arm of Boone Reservoir, dating as far back as 1955. So far as we know, no previous kills had occurred on the South Fork Holston arm of this reservoir. The history of past fish kills includes two kills in June and July of 1955 reported by TVA's Watauga Steam Plant employees. The number of fish killed and causes was not stated, but waste discharges from the Elizabethton area were suspected by the Tennessee Game and Fish Commission.

In May 1961 a fish kill of unknown proportions was reportedly caused by a bacterial disease of fish, and the cause of a fish kill in 1962 in the Watauga arm was undetermined. Disease was suspected as the cause of a fish kill in October 1963. Fish kills in May and July 1964 were reported as being caused, most likely, by industrial waste. A large fish kill occurred in May 1966 involving over 100,000 fish, primarily shad, with the cause suspected to be parasitic infection.

In July 1968 a massive fish kill occurred in the Watauga arm of Boone Reservoir destroying 500,000 fish during the period July 9-13 due to toxic compound of mercury that leaked out of a steel drum in the reservoir. The cause of this 1968 fish kill was extremely difficult to track down, and it was not until all the more common causes of fish kills were eliminated that the toxic material and its source were pinpointed. The particular compound involved was used to control bacterial slime growths in manufacturing processes and consisted primarily of two chemicals in solution, phenylmercuric acetate and 2,4,6-trichlorophenol. The former compound is the more toxic to aquatic life and breaks down in form diphenylmercury.

An estimated 200 drums were floating in the reservoir at this time. Approximately 230 more steel drums were observed on shore above the waterline. Seventeen old houseboats and 16 docks with barrel floats and in various stages of disrepair were located in the vicinity of the fish kill. Twenty-nine drums were sampled and 28 were found to contain significant quantities of residual material. Bioassays showed that the material from seven of the drums was toxic enough to cause the fish to lose equilibrium, while material from two of the drums was

extremely toxic. One of the drums containing extremely toxic material was labeled "industrial micro-organism control." Bioassays performed with this material established that diphenylmercury was the toxic material involved.

This material killed 95 percent of 200 test fish within two hours at a concentration of one part diphenylmercury per billion parts, by weight, of water. Chemical determinations showed that this material was present in the reservoir water at the time of the fish kill in concentrations far exceeding those levels that were found to be extremely toxic to test fish.

Following the fish kill, which occurred in Boone Reservoir on the South Fork Holston River during the period May 9-13, 1969 (reported on earlier by John R. Thoman), we initiated, in cooperation with other agencies, an investigation similar to our 1968 study. Results of the investigation ruled out the more common causes of a fish kill; and as was reported earlier, mercury at a concentration of 9 ppb was found in the water in the kill area. However, we have failed to date to establish that the mercury was in a form that would be toxic to fish at these concentrations. Therefore, at the present time we are unable to verify, through bicassays and chemical determinations, that mercury was the cause of the 1969 fish kill. Our investigation is continuing.

TVA PROGRAM ON REMOVAL OF STEEL DRUMS

by
J. Porter Taylor
Director, Division of Reservoir Properties
Tennessee Valley Authority

I would like to briefly outline what the Tennessee Valley Authority is doing in its program to remove steel drums presently in use on its reservoirs.

It has been estimated that at the present time there are approximately 200,000 to 300,000 drums currently in use on TVA reservoirs. We have experienced a number of problems associated with these steel drums, particularly a litter problem, and also as hazards to navigation. It has been our experience that steel drums break loose from their moorings, scatter throughout our large reservoirs, and are washed up on shore. Many have deteriorated and sunk, and probably more are on the bottoms of our reservoirs than are in use.

As a general policy, the Tennessee Valley Authority had in the past approved steel drums for use as floatation for boat docks. In 1967 TVA adopted the policy that steel drums could not be used for floatation on new dock facilities and that by 1972 all drums would be eliminated. We assumed that during the five-year period drums presently in use would deteriorate and would need to be replaced by 1972 thus causing no great hardship on dock owners. We have encountered very little resistence in carrying out this program.

After the 1968 fish kill occurred, consideration was given to a requirement for immediate removal of all drums in Boone Reservoir. This would have been a difficult decision to make since TVA had promoted the use of steel drums for floatation from the middle '30's.

We encountered many individuals who were skeptical as to whether the fish kill actually was caused by chemical drums. Although a great many of the 20-25 thousand drums in Boone Reservoir were harmless in terms of their original contents, some undoubtedly did contain chemicals that could cause fish kills. The problem was to identify and remove the drums of potential danger.

Since the date of 1972 had been established for removal of all drums, the decision was made to work through cooperative programs in an effort to accomplish voluntary removal on Boone Reservoir. Through newspapers, radio and TV we advised the public of the problems of steel drums containing chemicals and offered to haul drums to disposal areas if they were delivered to designated collection points. The program was successful to a degree in that some 5,000 drums were removed from the reservoir.

In order to assist in the replacement of drums as floatation materials, it would be helpful if the states adopted legislation prohibiting use of drums on reservoirs. Such action would substantially assist regulatory agencies in dealing with the problem.

FLOOR DISCUSSION

Moderator
Howard D. Zeller

MR. HOWARD D. ZELLER: We have scheduled the afternoon session as a workshop to solicit thoughts and ideas from the audience. To open the discussion, I would like for representatives of the private power companies to comment on the use of steel drums in their reservoirs. First, I'll ask for a statement from Mr. John Farley of the Alabama Power Company, if he would come forward please.

MR. JOHN G. FARLEY, JR.: We have no prepared statement to make at this time, but I do have a question. What was the end product of the steel drums used in Boone Reservoir, and what was the nature of their use?

MR. WILLIAM R. NICHOLAS: The materials were used primarily for slime control in textile manufacturing plants.

MR. FARLEY: What is the possibility of this material getting into the waste stream and ultimately into our waterways?

MR. NICHOLAS: Quite remote. This slimicide is readily absorbed on organic material and would not likely be a problem.

MR. FARLEY: We are certainly interested in doing all that we can to call this matter to the attention of the general public. Right now, friendly persuasion would seem to be the best way to resolve the problem. I also think that publications pointing out the problem would help educate the public on the dangers involved.

MR. ZELLER: I agree on this approach. Back to the magnitude of the problem in Alabama impoundments, do you think you could estimate what percentage of docks and other facilities utilize steel drums in Alabama Power Company reservoirs?

MR. FARLEY: We have reviewed this problem in our impoundments, and right now, we do not think it is serious. The current trend seems to be the use of foam type materials. Actually, we have no legal means of controlling any structures in our reservoirs, and about all we can do is count them.

MR. ZELLER: I wonder if we could have a statement from Mr. Rutledge of the Georgia Power Company.

MR. FRED M. RUTLEDGE: We have no statement to make at this time; and, actually, we do not consider that we have a problem. We have no authority over floating structures in Georgia Power Company reservoirs, and we do not know how extensively steel drums are used. We have no instances of fish kills ever having been reported. Since the fish kill on Boone Reservoir affected primarily shad, and since I know the State has intentionally killed shad in some of our lakes, I was wondering why the alarm over the fish kill in Boone Reservoir?

MR. HUDSON M. NICHOLS: Any loss of fish due to water pollution is serious. In Tennessee, shad are important food fish in all of our reservoirs, and we may actually be involved in future programs of providing more shad for forage.

MR. BARRY O. FREEMAN: My experience along these same lines might be worth mentioning at this time. In certain lakes in the delta area of Mississippi, we have found that fish build up a very high

resistence to pesticides without necessarily succumbing to them. They build up very high levels within their bodies and are not reproducing. We have been unsuccessful in stocking these lakes and maintaining a fish population even to the point of finding these fish are not fit for human consumption. I would like to suggest that in considering pesticide problems the magnitude of the problem is not always necessarily measured in terms of a big fish kill.

MR. ZELLER: This is most interesting, and I think it illustrates that many of our problems with pesticide poisoning are just beginning to be documented.

MR. NICHOLS: I would like to comment further on the shad killed in Boone Reservoir. If we could have pinpointed the exact cause of this fish kill, we would have asked the responsible parties to contribute $46,000 for the shad killed since they are an important source of food for game fish in large reservoirs.

MR. RUTLEDGE: What was your basis for reaching this figure?

MR. NICHOLS: The number of fish killed is estimated and multiplied by the average value, which in the case of shad is two cents each.

MR. HERBERT H. ROGERS: I have a question for the power companies who commented earlier. Did I understand correctly that you have no control over leases on power reservoirs?

MR. FARLEY: In cases where we lease land, we might be able to make a case. Around all our reservoirs, particularly the older ones, we own a certain amount of land, which, in many cases, we subdivide and lease. In those cases, we can exert control over the type

of structure built. However, this is a small percentage. If we could adequately document what has been said here today, we might be able to persuade the public to eliminate steel drums as floatation devices.

MR. JOHN A. LITTLE: I have knowledge of a fish kill in a Missouri reservoir which was traced to steel drums. I believe, in this case, the drum contained DDT.

MR. ZELLER: Another subject I think we should explore is how State legislation could help control this problem. Mr. Nicholas proposed this in his comments this morning. I would like to ask Leary Jones to speak on the need for State legislation in Tennessee.

MR. S. LEARY JONES: Legislation could be passed, but it would be rough to enforce. An easier way would be for TVA to change their contract to include a clause covering the use of drums.

MR. J. PORTER TAYLOR: At the present time we operate under Section 26a.

MR. MILO A. CHURCHILL: I would like to point out that there is also the land rights clause in TVA which would be pertinent here.

MR. JONES: Isn't that the same law?

MR. TAYLOR: The only place where we have any right to control pollution is under our land laws. Where we have land rights, we can enforce them. Most of the land around Boone Reservoir is private. I would, frankly, hope that we would never have to pursue this matter in the courts.

MR. JONES: It is possible that Tennessee's Stream Pollution Control Board could rule to change the final date on the use of drums from 1972 to July 1, 1970. This would probably be the best approach,

it seems to me, since it would be difficult to get any legislation through at this time. The general public in the Boone Lake area would probably go along with it.

MR. TAYLOR: I am not sure that a majority of people would.

MR. NICHOLAS: We need reasonable time to effect this change. Actually, we are responsible for the drums being there in the first place. If we can accomplish a change-over within four years, we will be doing good.

MR. NICHOLS: Maybe a fish kill would put some urgency into the matter.

MR. NICHOLAS: It could and would if we had substantial evidence that all the drums are potentially dangerous. But this is not the case. Boone Reservoir provides the only documented evidence. I still think that public persuasion is the best way to accomplish our objectives.

MR. JONES: What do you think of the chances of getting a bill through the legislature?

UNIDENTIFIED SPEAKER: Could this be handled as an amendment?

MR. JONES: We can prohibit barrels under a general order from the Stream Pollution Control Board. I am concerned about how many other chemicals that are potential contaminants. How are you going to clean up the barrels? What is a satisfactory disposal method?

MR. ZELLER: We could add to this problem the extensive use of countless smaller containers and what effects they might have.

MR. JONES: Yes, this is true. According to newspaper accounts in Tennessee, everyone is predicting three more kills in Boone Reservoir this year.

MR. NICHOLAS: Well, if there are 25,000 barrels in use, you would assume that quite a few would rust through each year.

UNIDENTIFIED SPEAKER: This general problem has been discussed, and I recently had an opportunity to bring out some of these points at a recent pesticides advisory committee meeting. One consideration was the requirement that the wholesaler be required to place a deposit on the container and then do something with the empty containers. Another approach discussed was to require the return of an empty drum before a full one could be obtained.

MR. FARLEY: It seems we are really talking about two problems. If we emphasize the pollution aspects involved with the use of drums, we will persuade people to look more carefully for the type of drum they use. Actually, since one of the biggest problems is with boating safety, it seems this would be a logical approach and would give us a persuasive case against eliminating steel drums as boating hazards in reservoirs.

MR. ZELLER: I would like to call on the representatives from the U. S. Coast Guard for their comments at this time.

CMDR. DAVID H. DICKSON: We actually have no problem that I am aware of in the Eighth Coast Guard District. We are here as interested bystanders--to learn rather than contribute.

CMDR. JOHN C. DOWLING: We are aware that the problem exists. We have not been actively involved but have watched it being handled, we think properly, by TVA and the Corps of Engineers. Our position is essentially the same in that we do not have statutory or regulatory authority to do anything about the problem, although we would like to see steel drums eliminated.

MR. ZELLER: Have you received a great number of complaints?

CMDR. DOWLING: Only in the Cumberland River.

MR. ZELLER: Earlier we heard that the cost of steel drums as a floatation unit was about $3.00 and that styrofoam type floatation material around $7.00. Cost does not seem to be the major problem in resolving this issue.

MR. CHARLES MOAK: I would like to comment on Barnett Reservoir in Jackson, Mississippi, a 33,000-acre impoundment on the Pearl River. The reservoir, which was filled in 1965 and is operated by a water supply district, supplies raw water to the City of Jackson. Initially, we had a problem with drums; however, since the lake has been filled, this has ceased to be a problem. Our water level fluctuates only about 18 inches annually, so we can utilize fixed docks. We do not permit open moorings on the lake, and there is a monthly marina charge of $1.00 per foot of boats docked. This has resulted in higher class boats. We own the shoreline and lease the property. People can have boat docks at their home sites on the lake or they can moor on their own slips, but these must be either fixed piers or with styrofoam.

MR. ZELLER: Since we have another Corps of Engineers division represented, I would like to ask Mr. Carter if he wishes to comment at this time.

MR. THOMAS J. CARTER: All of our reservoirs generally use styrofoam floats. We do have steel drums in use and we could have a potential problem in Arkansas.

MR. ZELLER: Will you be following the same four-year program?

MR. CHARLES E. SOLOMON: Yes.

MR. ZELLER: I would like ask Mr. Tebo of FWPCA if he has any comments on surveillance and monitoring techniques.

MR. L. B. TEBO, JR.: Actually, levels causing fish kills that have been reported are not high enough to be picked up on monitors used in our present techniques. I would say that the number of fish reported killed is probably smaller than the number actually lost since it is difficult for a complete recovery in any fish kill.

MR. ARCHIE D. HOOPER: This is certainly true. In fish kill investigations, we always wonder how many fish were missed in our tabulation. It should also be pointed out that any material toxic to fish is also toxic to fish food organisms. Reproduction and growth may be affected and fish populations decline over a long period of time. I think we tend to overlook this factor in some of our chronic pollution areas where fish populations are being decimated.

MR. PAUL J. TRAINA: The general agreement is that steel drums do create problems in reservoirs. An inventory of reservoirs where they exist is needed. It seems to me there should be documentation of information on where drums are produced, at what plants, the

types of chemicals marketed, and where they are located. We must get at the source of the drums.

MR. RUTLEDGE: Would it be feasible to color code these drums? Interstate Commerce could require this.

MR. JOHN R. THOMAN: There are possibilities in prohibiting reuse of these containers. Something will probably have to be done. This meeting has not been as productive as it might have been. It seems to me that in this region the problem is mainly a federal problem and can be taken care of through control of access on reservoirs. There may be a need for state laws and possibly federal laws regarding the reuse of barrels. I would like to point out again that we stand ready to assist all agencies in investigating any fish kills or any other problems concerning toxicity of materials.

MR. H. A. METCALF, JR.: Is the authority of TVA and the Corps of Engineers more assumed than legal?

MR. THOMAN: I think they are legal.

MR. TAYLOR: The Board's adoption of our present policy was based solely on a navigational hazard. Where we own the land, there is no question as to our rights to enforce our policy. It will cost several thousand dollars for dock operators to convert. If there were a state law, it would strengthen enforcement.

MR. THOMAN: Thank you all for participating in the discussion. If there are no additional comments, I will call this meeting adjourned.

LIST OF ATTENDEES

Name	Agency	Location
Hudson M. Nichols	Tenn. Game & Fish Commission	Nashville
S. J. Trombetta	FWPCA	Atlanta
John R. Thoman	FWPCA	Atlanta
Howard D. Zeller	FWPCA	Atlanta
L. Glenn McBay	Ga. Game & Fish Commission	Atlanta
Charles E. Solomon	Corps of Engineers	Atlanta
Herbert H. Rogers	Corps of Engineers	Atlanta
Jack O. Mooney	Corps of Engineers	Mobile
William T. Donaldson	FWPCA-SEWL	Athens
John A. Little	FWPCA-SEWL	Athens
Alfred S. Chipley	Ala. State Health Department	Montgomery
Jack Hunnicutt	Ala. State Health Department	Montgomery
Frank J. Silva	FWPCA-SEWL	Athens
H. A. Metcalf, Jr.	Georgia Power Company	Atlanta
Fred M. Rutledge	Georgia Power Company	Atlanta
Marshall Gaddis	Ga. Water Quality Control Bd.	Atlanta
John G. Farley, Jr.	Alabama Power Company	Birmingham
J. Porter Taylor	TVA	Knoxville
Paul J. Traina	FWPCA-SEWL	Athens
Julian J. Raynes	Corps of Engineers	Atlanta
G. E. Dail, Jr.	C&S Fla. Flood Control Dist.	West Palm Beach
William V. Storch	C&S Fla. Flood Control Dist.	West Palm Beach
W. E. Starnes	Fla. Dept. Air & WPC	Tallahassee
Thomas J. Carter	Corps of Engineers	Vicksburg
L. B. Tebo, Jr.	FWPCA-SEWL	Athens
David H. Dickson	U. S. Coast Guard	New Orleans
John C. Dowling	U. S Coast Guard	St. Louis
William R. Nicholas	TVA	Chattanooga
Joe D. Brown	Miss. Board of Health	Jackson
Barry O. Freeman	Miss. Game & Fish Commission	Jackson
Clyde Copeland	Pearl R. Valley Water Supply Dist.	Jackson
Charles Moak	Pearl R. Valley Water Supply Dist.	Jackson
Milton F. Parkman	Corps of Engineers	Vicksburg
Archie D. Hooper	Ala. Dept. of Conservation	Montgomery
A. L. McKnight	Corps of Engineers	Jacksonville
Paul J. Schouboe	Fla. Board of Health	Jacksonville
S. Leary Jones	Tenn. Steam Pollution Control Bd.	Nashville
Milo A. Churchill	TVA	Chattanooga
Thomas A. Waters	Corps of Engineers	Savannah